ILLUSTRATIONS OF ERROR IN THE DIAGNOSIS OF SOME NERVOUS DISEASES.

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A FEW years since, a distinguished neurologist of New York, Dr. William A. Hammond, called my attention to the frequency with which chronic inflammatory and degenerative affections of the spinal cord are incorrectly diagnosticated and treated as rheumatism.

This fact, made more impressive by seeing and examining at the Post-Graduate Medical School a number of patients who had been treated for rheumatism by practitioners otherwise well informed, has been of great diagnostic importance to me in my neurological career, and I purpose in this paper to reinforce Dr. Hammond's assertion, by presenting a few observations of my own which have been selected during the last two years from a large number of cases in which there was notable failure in the diagnosis.

The cases in question were examined for medico-legal reasons, and each was accompanied by more or less voluminous written testimony of physicians who had recorded such diagnoses as chronic rheumatism, rheumatism and heart disease, rheumatism and disease of eyes, malarial poisoning, disease of the liver and spleen, sunstroke and resulting loss of sight, general prostration and debility, sciatica, and other vague pathological generalities. These certificates of disability were written by medical men from widely distant points of the United States and by surgeons of the army and navy.

For convenience I have divided the cases into three

groups; the first including those in which the lesion is confined to the posterior columns, the second those in which there was a more general spread of the sclerosis, and the third those in which cerebral symptoms were a prominent feature.

I.

CASE I.—A man of 44 came under notice on May 11th, 1885. For a number of years he had been ineffectually treated for "rheumatism and resulting disease of the heart." He complained of pains in the chest, with shortness of breath and pains in all the joints; of a "dead-like" feeling and no use of limbs; of lightning-like pains in legs, tenderness in back, and a feeling as if a ramrod were in his spine.

The objective symptoms showed no external changes from rheumatism, and the patient appeared to be fairly well nourished. The pulse, from excitement of the examination, was accelerated (112), and the heart's action somewhat irregular; respiration 18; temperature normal. The area of the cardiac dulness was extended transversely, and a musical bruit accompanied the period of both sounds of the heart over the region of the mitral valves. There was apparent tenderness over the lumbar spine, a tabetic walk that became more aggravated when the eyes were shut; and an absence of the patellar tendon reflexes. Various tests showed loss of sense of the topographical relations of different parts of the body and corroborated so plainly the lesion of the æsthosodic system that a tyro ought not to have failed to recognize the existence of a tabetic affection.

CASE II.—In the next case of supposed "rheumatism," seen June 4th, 1885, the development of locomotor ataxy was more rapid. It was that of a man of 39 who was taken sick January 16th, 1885, and paid but little attention to his limbs till March, when he had to use crutches. He complained of continued pain in both upper and lower limbs and in the back of neck, and of sharp darting pain in the lower extremities; of pains and palpitation of

heart, shortness of breath, loss of appetite and sleeplessness; of impaired eyesight and of inability to walk since March 1st of the current year.

At the time of examination, the patient was confined to bed and in an acute febrile condition. His temperature was 102.2°, pulse 112, respiration 24; tongue coated.

There was tenderness on pressure over first dorsal vertebra; some atrophy of muscles of the lower extremities; complete absence of the patellar tendon reflexes, and an inability to touch tip of ear or nose with the eyes closed. Parallelism of the optic axes perfect; no paresis of ocular muscles, and the eye grounds were normal in appearance. Vision equal to $\frac{10}{xx}$. Complained of a slight halo around candle, but vision seemed not to be seriously impaired. There was, however, well-marked myosis, the pupils being almost unaffected either by darkness or light. This iridoplegic sign, taken in connection with the history of the case and the presence of other tabetic symptoms, left but little doubt as to the diagnosis.

CASE III.—The next case, seen Sept. 15th, 1885, is that of a man of 58 who had also been treated for "rheumatism." He complained of resting badly at night and of being scarcely able to turn in bed; the left arm and leg were worse than the right. Said that he sometimes falls down, and that his whole body is sensitive, but that he has no swelling of the joints.

Objective manifestations supported many of the patient's statements. There was nothing abnormal about either respiration or temperature; but he was much emaciated, and motor inco-ordination was shown by a painfully tabetic walk and inability to stand without invoking the supplementary aid of the eyes. There was loss of knowledge of the topographical relation of parts of the body, with apparent tenderness over lumbar spine; inability to differentiate æsthesiometric points, and an entire absence of the knee-jerk. I was unable to find any structural change indicative of rheumatism.

CASE IV.—On October 5th, 1885, another instance of the kind in a man of 44 came under my notice. This man

had been treated five years for "rheumatism and disease of the eyes," which disabilities he alleges were contracted in Colorado. He complained of shooting pains in the legs, of great difficulty in walking, and of double vision.

Examination showed loss of sensation in the lower extremities, inability to stand or walk with eyes shut, absence of knee-jerk, and a tottering, unsteady gait. The action of the heart was forcible and increased, with a musical systolic bruit over the apex, and the area of cardiac dulness was increased; no external evidence whatever of rheumatism. Eye tests showed O. D. V = $\frac{15}{xx}$, O. S. V = $\frac{10}{xx}$. There was homonymous diplopia from inco-ordination of oculo-motor nerves, also some atrophy of both optic nerves.

CASE V.—On October 29th, 1885, a man of 28 was the next tabetic patient seen. He had a medical record of "rheumatism, impaired eyesight, and general debility." He stated that he had become sick in China, and that, on account of his staggering gait, he was often accused of being drunk, though perfectly sober. He complained of sharp pains extending from the small of back to feet; of sharp, tingling pains in the soles of feet, and of a sensation of tightness around waist. Gives out easily. Eyesight is much impaired. Has occasional spells of vomiting, and throat is occasionally troublesome. Besides these symptoms, is troubled with a painful discharge from hæmorrhoids. Admits having had a soft chancre, but never any constitutional symptoms.

In this case, no evidence of rheumatism was found. The tabic walk betrayed the patient before he had begun his tale, and examination revealed an inability either to stand or walk, or touch tip of nose or ear with index finger when the eyes were closed. Knee-jerk absent. Heart's action excited, but no valvular lesion. Right eye showed vision equal to $\frac{15}{00}$, when myopia is corrected; the left, $\frac{15}{45}$, when myopia of $\frac{1}{16}$ is corrected. Both optic disks blanched and indicating well-advanced atrophy, particularly the right. Structure of both eyes myopic. A large crescent on margin of right disk, and a smaller one on that of left.

Another visit from this man, on May 27th, 1886, showed

an aggravation of the symptoms. He had undergone some emaciation, being 5 feet 10 inches and weighing but 129 pounds. Complained of constant pain all over body, but mostly in legs. It is occasionally sharp and darting, like needles sticking in legs. Is dizzy and unable to walk without a cane or other support. Toes feel as if too big for shoes.

Further examination only strengthened the previous diagnosis. The tendon phenomena, motor inco-ordination, and slight disturbance of the sensibility were more marked than previously. The heart's action was excited and irregular, with a systolic bruit over its apex. Vision of left eye $\frac{15}{90}$; right, $\frac{3}{150}$. Both myopic about $\frac{1}{18}$ for left. With this correction, $V = \frac{15}{45}$ for left. Neither eye further improved by any lens. Nasal side of both visual fields much impaired; temporal side of visual field somewhat contracted. Color sense fair. Large crescent on margin of each optic papilla, and the disks, particularly the right, were blanched, indicating well-advanced atrophy. No change in region of macula lutea. Media clear; pupils movable. No cicatrices on glans penis or on groins, but the cervical and inguinal glands and those of the epitrochlear space were engorged.

CASE VI.—My next "rheumatic" case is that of a man of 45, who was seen on January 14th, 1886. He also was much under weight, being 5 feet 9¾ inches and weighing but 120. For some time, his lower extremities, according to his statement, had been partly paralyzed, and he was unable to use himself, being obliged to have help when he goes out. Cannot stand to wash his face, because shutting of eyes, in doing so, makes him tumble over. Is losing his memory.

The ataxic and other symptoms of tabes dorsalis were too evident in this case to bear recital.

I saw the patient again on January 28th, when he complained of weakness and numbness in his legs; of gradually diminishing eyesight; of his fingers seeming all thumbs when he tries to pick up anything; of the same inability to

wash his face without sitting down; and of being very sensitive to cold.

At this juncture, there was noticeable, in addition to the other tendon phenomena, an absence of the cremasteric reflex. The left foot had become everted. No tenderness on pressure over spine; but impaired sensation of skin. No evidence of syphilis. Vision of right eye, $\frac{20}{xx}$; left, $\frac{5}{xx}$. Refractive media clear. Optic nerve of left eye much blanched, and calibre of retinal vessels much contracted, indicating advanced atrophy of optic nerve. Atrophy of right eye not so advanced. No evidence of choroiditis nor retinitis. Decay of vision result of tabes dorsalis. Evident mental impairment.

CASE VII.—The next case, that of an old stager, a former captain in the army, who had been the rounds of many physicians, was seen January 20th, 1886. His army medical record showed him to have suffered from "malarial poisoning, rheumatism, disease of heart, disease of the eyes, also bladder or urinary organs, and of liver and spleen," for all of which he drew an invalid-pension from the government. His history, when compressed, amounted simply to this: pains in eyes and legs and in urinary organs; sometimes sees things double.

All his symptoms showed well-advanced dorsal tabes. No splenic or hepatic enlargement. No external evidence of rheumatism. Is fairly well nourished; 5 feet 9 inches; 157. Action of heart excited and irregular; a systolic bruit over its apex; pulse 120. Incontinence of urine. Atrophy of right os calcis.

CASE VIII.—Incontinence of urine was also present in a case seen February 16th, which for many years had been treated as one of "malarial poisoning." The patient stated that he has to urinate frequently during the night; has cramps in feet and toes; has been impotent for last six months, and is losing his memory. Is sensitive to cold; vomits at times, and throat troubles him. ad partial paralysis of left side about eighteen months ago, and about three months since an attack of erysipelas.

This man was 45 years old, 5 ft. 5½ inches high, and

weighed but 96 pounds. His tabetic walk was difficult and unsteady; the usual defects of co-ordination and of diminished sensibility were present, as well as the existence of marked melancholia. The eye-grounds were, however, normal in appearance and there was no loss of co-ordination in the ocular muscles. Hearing of right ear $\frac{1}{48}$; left $\frac{6}{48}$. Both tympanic membranes normal in position and appearance; heard conversation at 20 feet. No splenic or prostatic enlargement and no hepatic symptoms. Incontinence of urine and this excretion loaded with phosphates. Catheter No. 9 passes readily into bladder. No evidence of syphilis.

CASE IX.—This case, under date of February 18th, 1886, is that of a corpulent army officer aged 59, whose record shows "heart disease resulting from injury of left side." He said that his whole left side is weak and lame; is always in pain; does not sleep well, is uneasy, cannot lie on left side, and has shortness of breath.

Examination failed to reveal any traumatic evidence of the alleged cause of the patient's condition. The pulse was 78, and the heart's action regular, but increased on exertion. Cardiac sounds normal, no increase in area of dulness, but evident irritability. There were present the ataxic symptoms consequent upon degeneration of the posterior columns of the spinal cord; atrophy of muscles of the left side of the body, more particularly in the gluteal region, and partial ptosis of left upper eyelid.

CASE X.—Seen March 3d, 1886. An emaciated and anæmic subject, whose former disabilities are reported to be "rheumatism, disease of the heart and lungs, incontinence of urine, and partial loss of sight." His testimony is that he has pain in the knees and stumbles on attempting to walk, pain in chest, and cannot sleep on either side. Pain extends around waist, has shortness of breath and spits blood. His urine dribbles away constantly, eye-sight is bad, being unable to see at night.

The patient's condition manifested itself by the characteristic tabetic stagger on attempting to walk with closed eyes, absence of knee-jerk, tenderness over lumbar spine,

involvement of vesical sphincter, and disturbed sensibility. Vision of right eye $\frac{15}{90}$, left $\frac{10}{150}$. Hypermetropia $\frac{1}{24}$. With this correction vision of right eye equal to $\frac{10}{xx}$, left $\frac{15}{70}$. Optic nerve of left blanched, with evidence of some atrophy. Considerable loss of visual acuity in right eye, but its ground not indicative of marked trophic change in nerve. Area of cardiac dulness much increased; apex beat transmitted to border of ensiform cartilage; musical systolic bruit over apex. Valvular lesion with hypertrophy. No dulness, but rather an exaggerated resonance over both lungs, with distinct mucous râles. No external evidence of rheumatism. Case speaks for itself.

CASE XI.—Another instance of "chronic rheumatism and resulting diseases of the heart" in a fairly well-nourished man of 51 came to me April 3d, 1886. He complained of severe pain in head and shoulders and across the small of back, and of severe vertigo. Heart almost jumped out of mouth at times when excited, and he has shortness of breath all the time.

The objective facts of this case failed to support the allegation of rheumatism, no external evidence whatever being present. The area of cardiac dulness was somewhat increased, action of heart excited and irregular, some roughness over region of mitral valves. Sensory and motor symptoms those of locomotor ataxy. Hypermetropia of both eyes equal to $\frac{1}{xx}$. With this correction, however, $V = \frac{17}{xx}$ and cannot be improved further by glasses. No trophic change in optic nerves, although some engorgement of retinal veins amounting to simple hyperæmia, a condition of vision probably owing to cerebro-spinal lesion.

CASE XII.—In the following case, seen June 28th, 1886, the patient, a medium sized man of 59, was thought to have incurred "affection of the eyes and disease of the heart and lungs from a gunshot wound of the head," received in the late civil war. His principal complaint was difficult breathing on walking and almost total loss of sight. No history of syphilis.

On stripping for examination, a small ventral hernia, an inch in diameter, was noticed three inches above the um-

bilicus. Area of cardiac dulness considerably increased, apex beat being felt below ensiform cartilage. Distinct bruit over apex indicating lesion of mitral valves. Dulness over apex of left lung, with bronchial breathing and slight mucous râles. Right lung more resonant, but vesicular murmur only faintly audible. Imperfect expansion of chest and some apparent tenderness on percussion over both lungs. There was a non-adherent V-shaped cicatrix on the scalp just over the craniometric point known as the *lambda*, and to this wound the patient attributed his ill health. Ocular examination showed vision for right eye to be $\frac{15}{150}$, that of left $\frac{15}{180}$, and both eyes slightly improved in vision by a lens of plus $\frac{1}{24}$. There was marked atrophy of both optic disks, particularly of the left, the papilla being blanched and the calibre of the vessels much diminished. Color sense impaired. Field of vision fairly good, but somewhat contracted on nasal side. The Argyll-Robertson symptom was present in a marked degree, with absence of the knee-jerk. The impaired sight in this case, when considered in relation to the other symptoms observed, can hardly be attributed to the effects of the gunshot wound.

CASE XIII.—A blind man of 60, whom I saw August 19th, 1886, stated that he had been unable to see for nearly twenty years, and that the only treatment he had had was for "sore eyes," which pained him continually, and that he had also had pain in his head, temples, and back.

Patient was much emaciated, being six feet and weighing but one hundred and five pounds; pulse 90; respiration somewhat quickened; temperature normal. No evidence of syphilis. Vision for both eyes 0. Complete atrophy of both optic papillæ. Disk whitened, and retinal vessels shrunken to mere capillaries. Has convergent strabismus of left eye. The disturbance of sensation, loss of thermic sensibility, disturbance of muscular sense, and the presence of symptoms common to tabetic patients, leave but little doubt as to the diagnosis.

CASE XIV.—In this case, one of "sciatica and piles," which came under observation on Feb. 7th, 1887, the

patient's venereal history was not so good. He was a man of 45, and said that sciatica does not trouble so much now as it did; but he had great difficulty in walking, with shooting pains in his limbs at times, and that in the dark he goes all to pieces.

The symptoms in this case were displayed in a manifestable way. There was the tabetic walk, the knee phenomenon, and inability to stand erect or walk, or to direct the movements of the limbs with precision when the eyes were shut. Vision for both eyes $\frac{20}{xx}$, and these organs were normal excepting the pupils, which were abnormally small (myosis). Glands of epitrochlear space enlarged; also other evidence of syphilis.

CASE XV.—The antepenultimate observation of this series concerns a retired naval officer, aged 51, who was seen by me on May 31st, 1887. A medical friend tells me that he has known of this case for the last twenty years, and that the patient has been treated for "partial paralysis, the result of injury to back and resulting disease of the heart."

Briefly told, the patient's symptoms were pain in the back, head, and limbs; inability to control feet and legs in walking; and difficulty in retaining his urine.

Tabic symptoms were here shown by the characteristic walk, the tendon phenomena, and by increased muscular inco-ordination on closing the eyes. Patient stout, but anæmic and feeble, and tongue tremulous when protruded. Pulse, sitting, 84; standing, 120, and heart's action so forcible after slight exercise that its pulsation could scarcely be counted. A musical bruit over its apex which was displaced downwards and to right of normal position. Also increase in area of cardiac dulness. Vision for both eyes $\frac{15}{xx}$. Has H. for both $\frac{1}{24}$, with which correction V is improved to $\frac{20}{xx}$. In other regards, eyes are normal. Mind seems sluggish; beyond this, intellectual functions apparently intact.

CASE XVI.—The last recorded instance of the kind that I shall mention came to notice a few weeks since, on June 3d. It is that of a physiological bankrupt of 63 years, the

diagnosis of whose complaint appears to have been a matter of extreme difficulty, since a mere enumeration of the various ailments for which he had been treated would take a large slice from the nosological table. Some of his disabilities were "deafness, disease of the left side the result of malarial fever, and resulting affections of the head, heart, and left knee."

The salient points of this patient's malady, as described by himself, were a whirring noise in both ears; pains in the whole left side of body, including the left side of the head, at which point it was not severe; extreme palpitation of heart after exertion; and almost total inability to breathe at times, when he feels like swooning away.

Cardiac and gastric disturbances were well marked in this case, with debility, insomnia, and tremulous tongue; difficulty and unsteadiness in walking; tendon phenomena; muscular inco-ordination; and the usual symptoms that go to show the existence of locomotor ataxy.

II.

The cases mentioned in the following group are not typical records of lesion in the kinesodic system; but the symptoms, both subjective and objective, seem to indicate the presence of combined sclerosis in which the spread of the disease to the antero-lateral columns had complicated the lesions of the posterior columns. In the majority of these cases, both patient and physician mistook the disability for rheumatism.

CASE I.—"Weakness of the back and stoppage of urine" were the diagnostic interpretations that caused a man of 40 to consult me on June 6th, 1885. He had been ailing for about ten years, and complained principally of loss of power in his legs, which appeared worse at night. The trouble in urinating not so great as formerly.

There was tenderness over dorsal spine; difficulty in co-ordinating muscular movements without invoking the supplementary aid of the eyes; muscular tremor, and exaggeration of the patellar tendon reflexes.

CASE II.—A man of 59, and fairly nourished, came to

me Dec. 3d, 1885, having been treated several years for "rheumatism." He complained of pains in his spine, chest, legs, and knees, and of shooting pains around waist and passing down into legs; of shortness of breath, and of great difficulty in climbing a stairway.

Careful examination failed to seize upon any symptoms that would justify a belief in the presence of rheumatism. The action of the heart was, however, excited and irregular. Area of cardiac dulness increased; a musical systolic murmur over its apex, with obstructive bruit over aortic valves. Other symptoms, those characteristic of spinal sclerosis.

CASE III.—Another of alleged "chronic rheumatism." March 16th, 1886. Man 49 years. Has pains in back and right side, particularly in right leg. Unable to walk without crutches. Sensation of band around waist.

No evidence of rheumatism. Area of cardiac dulness increased. Loud systolic bruit over apex of heart, action of which is excited, irregular, and much increased on exertion. Extreme shakiness and muscular motility; inability to control muscular movements unassisted by his eyesight; impaired cutaneous sensibility in lower extremities, and ankle-clonus in left leg.

CASE IV.—A large, well-nourished man of 51 was brought to me in a completely helpless condition on April 21st, 1886. He stated that he had for a long time been treated for "rheumatism," and that for the last two years he had been paralyzed from the small of his back downwards. No pain at present; but had formerly and very severe at times; sleeps well, appetite good, bowels constipated, but both bladder and rectum emptied without difficulty.

On examination, the lower extremities appeared normal, although the paraplegia was such as to prevent either walking or standing, the paralysis both of motion and sensation being nearly complete. Tenderness over lower portion of spine. Heart normal.

Under the use of the actual cautery applied to the spine and a course of static electricity, this patient is almost

entirely recovered at the present writing (July 6th). He complains of slight numbness only in the soles of his feet, and of slight muscular inco-ordination. He, however, stands and walks well with his eyes closed, and the patellar tendon reflexes are normal.

CASE V.—On May 20th, 1885, I was consulted by a medical man who lived in Mexico, and had been treated for "nervous prostration and diabetes." He stated that he is also subject to diarrhœa alternating with constipation, that he has pains in the small of back, frequent micturition, numbness of the extremities, palpitation of the heart, and loss of vision.

His symptoms showed nothing abnormal in temperature, pulse, or respiration, he was well nourished and 55 years of age. Tongue slightly furred, abdomen protuberant, but neither tender nor tympanitic. No splenic or hepatic enlargement, no piles. Action of heart irregular and forcible, musical murmur over apex with its first sound. Vision for both eyes $\frac{9}{150}$. This great loss of acuity owing to high degree of hypermetropia $\frac{1}{6}$, correction of which increases V to $\frac{15}{20}$, and to pannus involving both corneas to some extent, the latter disease being the result of severe granular conjunctivitis which has converted conjunctiva of both lids and balls into cicatricial tissue, causing also partial symblepharon and some xerophthalmia. Urinary analysis showed sp. g. 1.018, albumen 0, sugar 0, color sherry, and reaction acid. There was an inability to open and shut eyes alternately; exaggerated knee-jerks, and other symptoms characteristic of spinal sclerosis.

CASE VI.—November 15th, 1886. Still another case of "rheumatism" in a man of 37, who complains of a dead feeling all over, and of trouble in his head and eyes, the latter becoming gradually worse.

Morbid emotional disturbance in this case was very marked, the patient having sobbed on finishing his statement. Æsthesiometric examination showed impairment of the cutaneous sensibility in the lower extremities. Patellar tendon reflexes exaggerated. Slight general mus-

cular tremor. No evidence of rheumatism or of syphilis.

Patient was seen again on April 4th, 1887, when he still complained of a dead throbbing feeling in legs and over heart, and of pains in head. He stated that he gets easily tired and cannot talk without his tongue getting all tangled up.

As at the previous examination, the heart was found to be healthy, and there was no evidence either of rheumatism or syphilis. The pupils were more dilated than normal, but no contraction of visual field, vision being $\frac{20}{xx}$ for both eyes. In addition to former symptoms, marked disturbance of speech was noted, the disease having impeded the innervation of the lips and tongue to such an extent as to produce the peculiar defect of articulation sometimes observed in such cases.

CASE VII.—February 12th, 1887. Another case of "chronic rheumatism," but this time the previous diagnosis was not quite on the *lucus-à-non-lucendo* principle, since some traces of articular rheumatism were apparent. The patient, aged 51, complained of pain all through his body; of inability to see with his right eye, and of being all crippled up.

Examination showed a somewhat corpulent person with a pulse of 120, which increased to 150 on slight exercise. The joints of the left hand were enlarged; the right could neither be flexed nor extended, and the grasp of the left was much impaired. Right arm atrophied one inch and a quarter, and temperature of right forearm somewhat lowered. Heart's action forcible and excited, with slight roughness over the apex, but no hypertrophy or pronounced valvular disease. There was great exaltation of both superficial and deep reflexes, with ankle-clonus, intention tremor, and muscular inco-ordination. Vision of right eye 0; that of left $\frac{15}{30}$. The latter improved to $\frac{16}{20}$ with $+\frac{1}{24}$. Right optic disk blanched, the vessels so shrunken in calibre that arteries are scarcely perceptible. Cornea has an opacity over pupillary area. Left optic disk somewhat blanched, indicating incipient atrophy. Optic axes diverge; projection very bad.

CASE VIII.—This case, hitherto recognized as "rheumatism," was in the person of a broken-down old man of 71, with arcus senilis and paralysis agitans. He called on me March 18th, 1887, complaining of pain and stiffness in all his joints; of piles and dizziness, and of inability to exert himself without great pain in the back.

Inspection failed to reveal any external evidence of rheumatism. Action of heart forcible and intermittent, with musical bruit over its apex; increase in area of cardiac dulness and transmission of apex beat to ensiform cartilage. No psychic or sensory symptoms; but absence of knee-jerk and presence of muscular inco-ordination.

CASE IX.—The following case, in which paralysis agitans had been incorrectly diagnosticated, came under notice May 4th, 1887. It was in a large man of 57, who stated that his tremor is so great as to prevent his either reading or writing; and that in addition thereto he is troubled with a sense of constriction about his heart, and with shortness of breath.

Objective signs showed both hypertrophy and valvular lesion of the heart. Entire body from head to foot was in a tremulous condition, the head being uncontrollable except when held. In brief, the symptoms present were rather those of disseminated sclerosis.

CASE X.—If I may be allowed to express myself in the form of an hibernicism, I should say that the last case of "rheumatism" mentioned in this group is one of progressive muscular atrophy.

It occurred in an ill-conditioned man of 53, whose subjective symptoms were pain in the eyes and neck, nervous prostration, deafness, and troubles of eyesight, being at times unable to see at all, and at others seeing double.

Cardiac hypertrophy with valvular disease was present; but there were no external indications of rheumatism, and patient declared that he does not now suffer from that cause.

There was general muscular tremor with fibrillary twitchings, and the atrophy was most marked in the muscles of the right leg. Vision of right eye $\frac{8}{120}$; left $\frac{12}{120}$.

Projection bad; divergence of optic axes; pupils sluggish. Well advanced atrophy of both disks, and diminished calibre of retinal vessels. Hearing, both ears $\frac{0}{48}$. Both tympanic membranes opaque and sunken, with narrowing of both Eustachian tubes.

III.

The cases of the concluding group, in which cerebro-spinal symptoms predominate, were all incorrectly diagnosticated; rheumatism, malarial poisoning, and sunstroke being the principal factors of error.

CASE I.—A man of 38 complained to me on May 19th, 1885, of the results of a horse bite on the right forearm, which he had sustained about a year previously in Kansas. Among his symptoms he mentioned constant darting pain in right arm and leg; a feeling of a band around his waist; incontinence of urine; and of incessant motion of the right arm and leg, which kept up even during sleep.

Observation showed the scar on the forearm to be of a trivial nature. There were complete right hemiplegia; general muscular inco-ordination; exaggerated reflexes; spinal tenderness, and a spasmodic action of the affected side, which may have been post-hemiplegic chorea, but bore a stronger resemblance to athetosis.

CASE II.—The next case seen by me, June 2d, 1885, was that of an Englishman of 23, who a year previously, in one of the Western States, had suffered from "apoplexy and paralytic stroke." He was unable to speak; but he indicated by signs that he had pains and tremors in his right side.

He was fresh colored, apparently well nourished, and there was nothing abnormal about pulse, temperature, or respiration. Muscles firm, limbs symmetrical, and no appreciable difference in temperature of either side. Walks with difficulty. Writes with right hand and uses it with tolerable facility in dressing and undressing. Intellect seemingly not much impaired, and though aphasic, he makes audible but inarticulate replies to questions.

I saw this man again February 18th, 1886, at which time both the aphasia and agraphia had increased; he was unable to express himself either verbally or by writing except to a limited degree. Amimia was not yet very marked, as he could communicate by gesture to some extent, and gave me to understand that he can no longer write with the right hand, that he is deaf in right ear, and cannot see well with the eye of that side.

He replied by writing with the left hand short but barely intelligible answers to several questions, and did not speak beyond saying "No." Is still well nourished; no diminution of muscular volume in right half of body, which is hemiplegic. Vaso-motor disturbance and mental impairment also noted. Since patient could make no statement, it was difficult to ascertain with certainty the condition of his sight and hearing. The vision for left eye appeared to be 1; that of right $\frac{1}{150}$. Hypermetropic astigmatism of the latter, but no positive evidence of atrophy of optic nerve. Hearing, right ear $\frac{0}{48}$. Tympanic membrane normal in position and color. Left ear, hearing $\frac{30}{48}$, and membrane same as in right. Deafness probably owing to lesion of portio mollis.

A third examination, September 29th, 1886, showed patient's condition in every way worsened. He was unable to communicate his condition except by imperfect signs; from one hundred and fifty his weight had decreased to one hundred and thirty pounds, and enfeeblement of the intellect was more marked.[1] The otoscopic signs were those previously noted. Ophthalmological examination showed impaired vision with incipient atrophy of the optic disk.

CASE III.—On September 2d, 1886, another instance of aphasia with mental impairment came under my notice. It was that of an ill-conditioned man of 40 years, whose disability had been reported as "sunstroke and resulting loss of sight of eyes, and general prostration," for which he had been discharged from the army.

[1] This man having since been accused of a criminal office, a question arises as to his responsibility.

The subjective symptoms were still more difficult to get in this case than in the preceding one, owing to the patient's "general prostration," which consisted in utter helplessness and apparent complete aphasia, agraphia, and amimia.

There was nothing abnormal in pulse, respiration, or temperature, excepting coldness of the extremities; tongue much furred; sensation of touch and of pain greatly diminished; can raise hands to mouth and has considerable grasp; knee-jerk exaggerated; incontinence of urine; right oculo-motor nerve paralyzed with divergent strabismus of right eye and ptosis; optic axis of right eye diverted outwards and downwards; eyes practically movable in this position; disk somewhat blanched, that of left eye normal. He has vision in each eye as proved by his grasping objects presented to him; but it is impossible to determine the exact amount of loss, owing to the patient's abnormal cerebral condition, which prevented expression and so clouded his intelligence that it was with difficulty that he could be aroused.

CASE IV.—In the next case (September 17th, 1885), there was something more than "rheumatism and disease of the heart and eyes." The patient, a slight man of 34, with nothing abnormal as to pulse or respiration, complained of being unable to get around without assistance, owing to the uselessness of his right arm and leg, and pains in the back caused by every jar of his foot. He also alleged shortness of breath on slight exertion, constipation, incontinence of urine, spinal tenderness, and poor eyesight, which was particularly so in right eye.

Examination failed to reveal any symptom of rheumatism or heart disease. There were, however, spinal tenderness, loss of motion and of sensation in both upper and lower extremities, with vaso-motor disturbance and diminution of temperature, atrophy of the hemiplegic muscles, dyskinesia, exaggerated knee-jerk, and ankle-clonus. Vision of right eye, $\frac{15}{60}$; left, $\frac{15}{45}$. Engorgement of right papilla amounts almost to choked disk, its margin being cloudy and scarcely definable. Left optic papilla

showed less vascular disturbance, but disk itself somewhat blanched and indicative of slight atrophy.

CASE V.—"Malarial poisoning, rheumatism, and resulting disease of heart" perhaps never showed themselves with more vagueness than in the following case:

April 14th, 1886. Man of 54; occupation seaman; hails from a malarious locality in Virginia; is 5 feet 8¾ inches high, weighs 150 pounds. Says he has lost all use of right side; that his heart thumps; is short-winded; sleeps badly, and has lost his memory.

This man's complexion was somewhat sallow and his tongue slightly furred; but there were no splenic or hepatic symptoms, nor any hæmorrhoids, evidence of rheumatism or of heart disease. Muscles of right side considerably atrophied; circumference of leg two inches, of arm one inch less than that of left. Sensation of right half of body impaired. Well-marked ataxic symptoms, exaggerated knee-jerk, and ankle-clonus. Hearing right ear $\frac{0}{48}$; left $\frac{6}{48}$. Both tympanic membranes much sunken, and handles of mallei thrown into sharp relief. Left Eustachian tube much narrowed. Presence of naso-pharyngeal catarrh accounts for impaired hearing. Evident mental impairment, disorder of the memory being very marked.

These cases speak for themselves. It will, however, be seen that many details concerning previous condition, such as the patient's family history, atavistic antecedents, alcoholic and nicotinic habits, and the like, have been omitted. This was purposely done, not only for the sake of brevity, but more particularly because of the irrelevance of asking questions that might have suggested symptom pictures to a class of patients whose interest it was to magnify their ailments.

I have dwelt at some length upon the condition of the eyes in the cases under consideration; for it seems to me that a study of the alterations of the eye, as shown by means of the perimetric records of the visual field, and by the ophthalmological images of the intraocular changes

found at its posterior segment, has done so much to advance our knowledge of nervous diseases that the signs developed by this mode of inspection are almost pathognomonic, and should for that reason take a high rank in diagnosis. Of course, it is not pretended that the intraocular changes by themselves are of absolute significance any more than a subcrepitant râle or a bronchial inspiration, yet they lend to the diagnosis of cerebro-spinal disease an additional source of correctness, and, to say the least, are important complements to other symptoms. Taken collectively and associated with other symptoms furnished by the patient, the lesion of the nerve structure of the eye confirms the diagnosis by corresponding presumably to what is taking place in other parts of the nervous system. In a recent article on "cerebroscopy"[1] I have endeavored to show the importance of studying the alterations of the eye in connection with nervous diseases.

Iridoplegia and the condition of the eye-grounds, taken in connection with the knee phenomenon, may in certain instances give rise to confusion, notably in the case of negroes, among whom exists a certain obtusion of peripheric sensibility probably corresponding to the flattening of the tactile corpuscle, which renders it difficult to disturb the negro organism by a reflex action. Two persons of this race suffering from locomotor ataxy having lately come under my notice showed absence of the knee-jerk with other tabic characteristics; but on subsequent examination of fifty-two other negroes who had no symptom of nervous disease, to my surprise, I succeeded in getting the knee-jerk in but one instance, and that only after interlocking the fingers and causing traction.

Cerebral and mental symptoms are noticeable features in a considerable number of the cases herewith mentioned. In Case VI. of the first group dizziness was a subjective symptom, while vertigo played a similar part in Case XI. Amnesia and hebetude were found in Cases VI. and VIII.

[1] "Reference Handbook of the Medical Sciences."

of group one; mental impairment with disorder of the memory in Case V. of group three; aphasia with mental impairment in Cases II. and III. of group three; morbid emotional disturbances in Case VII. of group two, and melancholia in Case VIII. of the first group.

These mental symptoms, taken in connection with the others—sensory, motor, and trophic—herewith recorded, may be interpreted as medical facts that affect criminal responsibility and questions of civil incapacity, and if they have no other significance they at least show in the matter of chronic affections of the spinal cord that, so far from being "one of the most thoroughly understood in the whole range of medical science," and their recognition "one of the easiest problems of neurological differentiation," as we are told by most recent and trustworthy authority, they are, as a matter of fact, questions the solution of which appears to have been one of difficulty and error among practitioners both far and near.

1732 H St., N. W.